

THE CLAIMS

We claim:

1. A method of manufacturing a golf ball having one or more layers comprising the steps of:

5 forming at least one layer of the golf ball from material comprising a base rubber material and one or more pre-vulcanized or pre-crosslinked materials,

wherein said pre-vulcanized or pre-crosslinked materials comprises greater than about 60 parts of one or more pre-vulcanized or pre-crosslinked material per 100 parts of base rubber material in said layer; and

10 subjecting the at least one layer to a high pressure, high temperature sintering process.

2. The method of claim 1, wherein the at least one layer of the golf ball comprises from about 60 parts to about 200 parts of one or more pre-vulcanized or pre-crosslinked material per 100 parts of base rubber.

3. The method of claim 2, wherein the golf ball comprises from about 70 parts to
15 about 150 parts of one or more pre-vulcanized or pre-crosslinked material per 100 parts of base rubber.

4. The method of claim 1, wherein the golf ball comprises one or more of a core, intermediate layer, and cover, and wherein the pre-vulcanized or pre-crosslinked material is disposed in at least a portion of the core, intermediate layer, cover, or a combination thereof.

20 5. The method of claim 2, wherein the pre-vulcanized or pre-crosslinked material is a thermoset material selected from the group consisting of a thermoset natural or synthetic rubber, thermoset polyurethane, thermoset polyurea, thermoset polyolefin, thermoset phenol-formaldehyde resin, thermoset amino resin, thermoset furan resin, thermoset unsaturated polyester resin, thermoset vinyl ester resin, thermoset cyanate esters, thermoset acrylic resins,
25 thermoset epoxy resin, thermoset silicones, thermoset polyimides, styrene butadiene; polybutadiene; isoprene; polyisoprene; *trans*-isoprene; ethylene propylenediene rubber; fluoroelastomer; silicone rubber; epoxy rubber; nadimide-, cyanate- or maleimide-terminated thermosetting polyimides; and mixtures thereof.

6. The method of claim 1, wherein the pre-vulcanized or pre-crosslinked material further comprises a *cis-to-trans* catalyst and free radical source; a crosslinking agent; a vulcanization accelerator; an anti-reversion agent, or a mixture thereof.

7. The method of claim 6, wherein the anti-reversion agent is 1,3-*bis*-(citraconimidomethyl)benzene, hexamethylene-1,6-*bis*(thiosulfate), or a mixture thereof.

8. The method of claim 1, wherein the golf ball has an Atti compression of at least about 40.

9. The method of claim 1, wherein the golf ball has a coefficient of restitution of at least about 0.7, and wherein the golf ball has an initial velocity of about 245 ft/s or greater.

10. The method of claim 1, wherein the golf ball has a coefficient of restitution of at least about 0.78.

11. The method of claim 1, wherein the golf ball has a ball spin rate of about 1200 rpm to about 4000 rpm when the golf ball is hit with a golf driver.

12. The method of claim 1, wherein the golf ball has a ball spin rate of about 6500 rpm to about 10,000 rpm when the golf ball is hit with an 8-iron.

13. A method of forming a golf ball having one or more layers consisting essentially of one or more pre-vulcanized or pre-crosslinked; and further comprising the step of re-crosslinking the pre-vulcanized or pre-crosslinked material in the at least one layer by high pressure, high temperature sintering.

14. The method of claim 13, wherein said golf ball is a 1-piece golf ball.

15. The method of claim 13, wherein the pre-vulcanized or pre-crosslinked material is a thermoset material selected from the group consisting of a thermoset natural or synthetic rubber, thermoset polyurethane, thermoset polyurea, thermoset polyolefin, thermoset phenol-formaldehyde resin, thermoset amino resin, thermoset furan resin, thermoset unsaturated polyester resin, thermoset vinyl ester resin, thermoset cyanate esters, thermoset acrylic resins, thermoset epoxy resin, thermoset silicones, thermoset polyimides, styrene butadiene; polybutadiene; isoprene; polyisoprene; *trans*-isoprene; ethylene

propylenediene rubber; fluoroelastomer; silicone rubber; epoxy rubber; nadimide-, cyanate- or maleimide-terminated thermosetting polyimides; and mixtures thereof

16. A method of forming a golf ball having one or more layers comprising substantially of one or more pre-vulcanized or pre-crosslinked material; and

5 wherein the pre-vulcanized or pre-crosslinked material in the at least one layer is re-crosslinked by high pressure, high temperature sintering.

17. The method of claim 16, wherein the pre-vulcanized or pre-crosslinked material is a thermoset material selected from the group consisting of a thermoset natural or synthetic rubber, thermoset polyurethane, thermoset polyurea, thermoset polyolefin, 10 thermoset phenol-formaldehyde resin, thermoset amino resin, thermoset furan resin, thermoset unsaturated polyester resin, thermoset vinyl ester resin, thermoset cyanate esters, thermoset acrylic resins, thermoset epoxy resin, thermoset silicones, thermoset polyimides, styrene butadiene; polybutadiene; isoprene; polyisoprene; *trans*-isoprene; ethylene propylenediene rubber; fluoroelastomer; silicone rubber; epoxy rubber; nadimide-, cyanate- 15 or maleimide-terminated thermosetting polyimides; and mixtures thereof.

18. The method of claim 16, wherein said golf ball is a 1-piece ball.

19. The method of claim 16, wherein said golf ball has an Atti compression of at least about 40, a coefficient of restitution of at least about 0.7, and an initial velocity of about 245 ft/s or greater.